

REMARKS

Claims 1-20, all the claims pending in the application, stand rejected. Claims 1-3, 5, 7, 10-13, 15, 17 and 20 are amended. As to the amendments to claims 1 and 11, the word "database" is supported in the originally filed specification at page 10, line 21. Claims 4 and 14 are cancelled.

Drawings

The Examiner objects to the drawings because words in Figs. 2, 4, 5 and 7 are misspelled. The Examiner suggests certain changes to the drawings. Accompanying this amendment are replacement sheets of Figs. 2, 4, 5 and 7.

Claim Rejections - 35 U.S.C. § 103

Claims 1-7, 9-17, 19 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Muller (6,787,331) in view of Nields (6,459,925). This rejection is traversed for at least the following reasons.

The subject matter of independent **claim 1** involves a medical image processing method, while the subject matter of independent **claim 11** (using means plus function language) involves a medical image processing apparatus. According to the steps and functions recited in these claims, both (1) image data representing an image recorded by radiography and (2) photographing information to be displayed on a screen, as represented by photographing information data stored in a database, are obtained. Then, the position and size on the screen for displaying the photographing information is determined. Finally, the photographing information data are then added to one of (1) image data and (2) image attendant information, which is attendant upon the image data, and the added data is outputted. Notably, as now claimed, **photographing information data** representing photographing information to be displayed on a screen is automatically selected from the database on the basis of the information with respect to **photographing condition** of the image recorded by radiography.

The "**image data**" represents visible image data that is received from a reading unit 1 that reads a recording sheet, as illustrated in Fig. 1 and explained at pages 7-8 for a first embodiment.

The “**image attendant information**” includes patient name, data size, photographing condition (direction, portion of object), etc. related to the image, as also explained at pages 7-8. The terms “**photographing information**” and “**photographing information data**” are defined at pages 7 and 8 of the specification and may include character or image data used to identify the image (comparable to conventional lead characters that are superimposed into images).

Support for the claimed invention is provided in connection with the operation of several exemplary embodiments that include a processing section 2, particularly the CPU 10 of Figs. 1, 3 and 6 as described at pages 8,-11, 15 and 19, and the flowchart of Fig. 2, as described at page 11-14, the flowchart of Fig. 5, as described at pages 17-19, and the flowchart of Fig. 7, as described at page 20, for respective first, second and third embodiments. The systems of Figs. 1, 3 and 6 contemplate that the CPU 10 will include an image generating unit 21 that is coupled to a display 4 and is responsive to several units, including the data adding position selecting unit 24 and the image processing unit 26, which executes conventional image processing, such as normalization, gradation or logic reading (page 11, lines 2-8). The image generating unit also responds to the image attendant information processing unit 22, that receives photographing conditions, such as category of object, portion of object, directions, etc. that are input from an input unit 3, such as a keyboard or mouse, to the CPU.

In the exemplary embodiment illustrated in Fig. 1, a photographing information data selecting unit 23 automatically selects photographing information data corresponding to the required data from a database when the image attendant information processing unit 22 extracts required data from the image attendant information, as explained at page 10, lines 13-21.

Muller

The Muller et al patent concerns a device for taking radiologic images as illustrated in Fig. 1, where an x-ray tube 1 projects x-rays along an axis to through a subject having an area of interest (11, 13) to a receiver 3. The tube 1 is coupled to the receiver 3 via an arm 4, which permits movement along three axes. As mentioned in the Summary at col. 1, lines 50-67, the device includes at least two input devices, including a structure for detecting the angle of swivel of the arm as well as an input for inserting data relative to an organ to be studied. There also is a

processing means for determining the type of image that will be taken as a function of the input data concerning the angle of swivel and the identification of the object or organ. Finally, a display is provided for presenting an image generated by the processing means.

With regard to the use of certain photography conditions, Muller explains at col. 1, line 59-67, that the disclosed arrangement relieves the operator from a certain number of tasks and ensures accuracy. For example, there may be a variety of conventional positions as illustrated in Fig. 5, which may be measured by a pendulum type device illustrated in Figs. 6 and 7, and used as an input to control subsequent processing. As explained at col. 5, line 33-50, a detected angle of the arm may be compared by the processing means to threshold data in order to derive information relative to the types of views that are to be taken. Either the operator, using a keyboard, or a detection apparatus (compression pads or enlargement platform) may input information with regard to the particular views to be taken and enlargement factors to be applied. The angle of the arm may be displayed on a screen.

On the basis of the foregoing teachings, the Examiner asserts that Muller teaches all of the claimed subject matter except the function of determining position and size on the screen on which photographing information is to be displayed. In particular, the Examiner asserts that Muller discloses the step of “obtaining image data” at col. 3, line 1, “obtaining photographing information data” at col. 5, lines 33-35, “adding photographing information data to the image data” at col. 5, lines 37-38 and “adding photographing information to image attendant information” on the basis of the table in col. 6, particularly where angles and position information are included.

As a preliminary matter, Applicant notes that it has amended claims 1 and 11 by restating the function with respect to the photographing information data as being one of “automatically selecting” the photographing information data from a database, rather than simply “obtaining” such information. Given the change, it is clear that Muller et al does not disclose automatically selecting photographing information data representing photographing information to be displayed on a screen from a database on the basis of the information with respect to photographing condition of the image recorded by radiography, as recited in amended claims 1

and 11. Applicant also has expressly defined the term “attendant information” in the claim to be information which is “attendant upon the image data and includes information with respect to photographing condition of the image recorded by radiography.” These two additions clearly provide a basis for distinguishing over Muller.

In addition to the foregoing distinctions, it is clear that the “determining position and size” limitation is not taught, based on the Examiner’s own admission. At best, the disclosure at col. 6, lines 30-60 teaches that any image places characters that name a radiograph in the same predetermined location. There is no variability based on other factors or data and, thus, no consideration of position and size of a display.

Nields

The Examiner looks to Nields for a disclosure of the step of ‘determining position and size.’ In particular, the Examiner finds in Nields a teaching with respect to Fig. 18 where a “positioner rotation” is displayed on the screen. The Examiner asserts that it is “inherent that the position and size for the display has been taken into account.”

Nields illustrates in Figs. 10-20 a plurality of screens that may be displayed to a user for a variety of purposes, including input of information and output of information. Upon review of the Figure cited by the Examiner, Applicant notes that the illustration is of a display 1804 that includes touch screen input or selection buttons, data displays (lower portion) and radiologic or ultrasonic images (upper portion). Various inputs are combined by display processor 60, which is not disclosed in detail, to provide the display. As explained at col. 9, line 63 – col. 10, line 62, particularly at col. 10, line 35, the display may be in three dimensions and may show or simulate the entry of a puncture instrument 52.

Turning to the Examiner’s specific assertion with regard to Fig. 18, Applicant notes that the phrase “Positioner Rotation” appears to be in a fixed location and only the actual data “43” is changed. Applicant also notes that the remainder of the display, but for the upper left and upper center images, are in a fixed location with the radiologic or ultrasonic data possibly changing. Applicant also notes that the image includes an image of a biopsy needle as it enters the object under examination, which is overlayed onto the radiologic or ultrasonic image. However, the

needle is the only positionable item in the display, and there is no teaching or suggestion that a character, particularly one similar to the conventional character markers, may be positioned or have its size changed.

Thus, Applicant respectfully submits with respect to step (c) that the location and size of the “positioner rotation” information of Fig. 18 is fixed, such that there is no step of determining position and size on a screen. Specifically, Applicant asserts that each of the input screen, lower screen, and upper screen displays are in fixed and predetermined locations that are not variable. Placing the ultrasonic or radiologic image of Fig. 18 in the top left portion of the screen would require some positioning activity by the processor or controller 60, however, that activity also appears to involve a fixed and predetermined position. In short, there is no activity involving “determining” (defined as “to set limits” or “to decide upon”), a term that indicates an active and corresponding calculation process.

Thus, Applicant submits that there is no teaching or suggestion of determining position or size in Nields et al that would lead one skilled in the art to modify Muller in the manner claimed.

Applicants note that the “determining” step is part of a process of displaying, as illustrated in Figs. 2, 5 and 7. In order to better distinguish the activity of the invention from Nields et al and Muller, the term “selectively” has been used in claims 1 and 11 to further define the determination of position and size. The term “selectively” would preclude a one-time definition of a position or size.

Second, Applicant respectfully submits with regard to step (d) that there is no teaching that the “positioner rotation” information and image data display are formed as part of the same display data. Applicant submit with respect to step (d) that there is no teaching that the photographing information is added to one of image data and attendant data, as required by the claim. In other words, Fig. 18 does not show that the original image display is in any way varied by photographing information, as that term is defined in the application to include character data and image data. Further, there is no teaching in Fig. 18 of any attendant data that is modified by photographing information.

Applicant notes that the image of the needle is not “photographic information,” because they are not used to identify the image.

Finally, Applicants note that Nields does not remedy the basic deficiency of Muller, as previously discussed with respect to automatic selecting of photographing information data from a database.

Claims 2 and 12 would be patentable for reasons given with respect to their parent claims.

As to **claims 3 and 13**, which concerns generating image attendant information that includes photographing condition (direction, method of photography, etc.), the Examiner refers to the table in col. 6 and asserts that the limitation is met. As to selecting one kind of photographing information data from a plurality of kinds on the basis of the image attendant information, the Examiner looks to the teachings at col. 3, lines 51-66 with respect to a photographing condition (body part source) used for selecting a photographing information data (where more than one standard of photographing information data is available, as taught at col. 3 line 62). The Examiner considers the selection to be “automatic,” based on a mention that a user optionally can make a choice. The Examiner’s position, however, does not support the rejection since the different “standards” recited in the cited passage do not involve plural kinds of photographing information, as that term is defined. The image is rotated in Muller, but regardless of rotation, there is only one kind of photographing information. Moreover, the patentability of these claims further derive from the term “selectively” as added to claims 1 and 11.

Claims 4 and 14 these claims would be patentable for reasons given with respect to their parent claims.

As to **claims 5 and 15**, these claims would be patentable for reasons given with respect to their parent claims

With respect to **claims 6 and 16**, the Examiner notes that enlargement is disclosed at col. 4, line 36 and rotation is disclosed at col. 4, line 3 of Muller. Again, the patentability would derive from the reasons given with respect to their parent claims

Claims 7 and 17 concern converting plural characters input in accordance with plural kinds of photographing conditions into plural kinds of image data. These limitations are considered to be met by Muller's disclosure of converting a plurality of characters of photographing condition information (table in col. 6) into image data and photographing information data, on the basis of the teachings at col. 5, lines 33-38 of displayed angle information. The Examiner asserts that a display of a photographing condition necessarily means that it must already be in the form of data.

Applicant respectfully traverses this rejection and has placed the claims into independent form, as the table in col. 6 merely indicates a correspondence of views, angles, rotations, etc. The table is not disclosed as representing a look-up memory that stores plural characters that are input in accordance with plural photographing conditions and are later converted to plural kinds of image data. Moreover, Muller specifically teaches that a user should not enter character data, though Muller does mention that a few special view require entry of supplemental information (col. 6, lines 59-60). However, even with that brief mention, there is no teaching or suggestion in Muller that a user can input characters in accordance with different photographing conditions and convert the input to image data. In any event, the claims would be patentable for reasons given with respect to their parent claims.

With respect to **claims 9 and 19**, which define the "adding" step (d) as adding the photographing information data (character showing direction) to the image attendant information (name of patient, image size, etc.), the Examiner asserts that Muller teaches this feature. Applicant notes that Muller does not teach precisely how or where the "conventional" notation is added to image attendant information, as those terms are defined in the specification and claims. Further, Applicant submits that the claims are patentable on the basis of their parent claims.

Finally, with respect to **claims 10 and 20**, the Examiner asserts that Muller disclosed changing the photographing information data obtained (angular limits) on the basis of the

teaching at col. 4, lines 51-53. However, Applicant submits that there is no teaching in Muller that any photographing information may be changed. At best, the addition of supplemental information is suggested at col. 6, lines 59-60, but this does not involve changing the photographing information in the manner taught at page 18 of the present application. These claims have been amended to expressly refer to the selected photographing information. Moreover, these claims take their patentability from their parent claims.

Claims 8 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Muller (6,787,331) in view of Nields (6,459,925) and further in view of Kaneko (4,783,832). This rejection is traversed for at least the following reasons.

The Examiner admits that neither Muller nor Nields expressly discloses superposing the photographing information data (particularly characters) into image data. The Examiner looks to Kaneko for a disclosure of superimposing character data on image data at col. 2, lines 21-22. The Examiner asserts that photographing information is often in the form of characters.

Kaneko

The Kaneko reference teaches a 20-year old bit-plane and character memory superposition arrangement for an X-ray, CT image, ultrasonic or MRI image. However, there is no teaching or suggestion as to how this video technique may be applied generally to the high definition images of a radiologic display, or specifically to the systems of Muller or Nields et al. As to Muller, there is no teaching as to the type of image generation processing that is conducted. Thus, there is no basis for modifying an unknown technique with the image plane architecture of Kaneko. Similarly, as to Nields et al, there is no teaching of the type of display processing that is used.

Finally, Applicant submits that Kaneko does not remedy the deficiencies of Muller or Nields with respect to the parent claims, and that these two claims would be patentable for at least the reasons previously presented.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

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Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

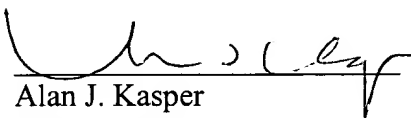
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AMENDMENTS TO THE DRAWINGS

Figures 2, 4, 5 and 7 replacement sheets.

Attachment: Replacement Sheet(s)